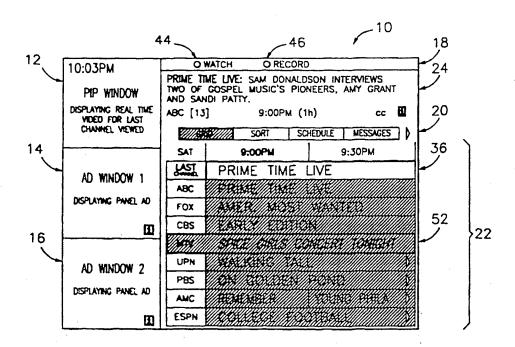| (51) International Patent Classification 6 : H04N 7/10	**A1**	(11) International Publication Number: **WO 99/07142**
		(43) International Publication Date: 11 February 1999 (11.02.99)

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(54) Title: SYSTEMS AND METHODS FOR AUDIENCE MONITORING

(57) Abstract

The present invention provides for modemless communication of television viewer profile data to a central location for analysis and interpretation of viewer interaction with the viewer's television and/or with an on–screen electronic program guide (10).

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SYSTEMS AND METHODS FOR AUDIENCE MONITORING

FIELD OF THE INVENTION

5   The present invention relates generally to television systems, and more particularly, to the communication of, statistics and characteristics concerning viewer interactions with a television, including the viewer's interactions with an interactive electronic program guide ("EPG").

BACKGROUND OF THE INVENTION

10   It is highly desirable to be able to monitor various television viewer interactions with the viewer's television set. For instance, an advertiser would find it instructive to know which television programs a viewer watches, which advertisements a viewer watches, the number of times a viewer changes channels. and what the viewer was watching immediately before changing channels. An advertiser would also find it instructive to know the number of times a

15 viewer of an EPG, such as Guide Plus+™, accesses the guide during a specific time period, what program or advertisement the viewer was watching immediately before entering the EPG, and other information concerning the viewer's interaction with the viewer's television and the EPG. Such information can be used to analyze the valuation of advertising on television and through

20 an EPG.

          The traditional way to monitor some of this information has been to equip a select number of television sets with modems, as is done to collect the Nielsen statistics. Typically, the modem-equipped television sets are placed in selected homes, whereby data concerning the viewing habits of the persons in the monitored homes is collected and is transmitted to a central

25 location on some periodic basis, such as on a nightly basis. The above-described modem-equipped television method is expensive and cumbersome, and only provides data for a limited number of selected households.

          Currently co-pending U.S. Patent Application. Attorney Docket No. 32714/LTR/E190 (Application No. not yet assigned) ("SYSTEMS AND METHODS FOR DISPLAYING AND

30 RECORDING CONTROL INTERFACE WITH TELEVISION PROGRAMS, VIDEO, ADVERTISING INFORMATION AND PROGRAM SCHEDULING INFORMATION") discloses an extensive system and method for capturing raw viewer profile data and for analyzing that data and the disclosure of which is incorporated herein by reference as if fully stated here. Such viewer profile information would provide advertisers with information with which further

35 advertising decisions can be made. For instance, such information can be used to evaluate the effectiveness of a particular advertisement. Such viewer profile information can be used to filter program listings or advertisements, and can be used to customize delivery of advertisements to particular viewers.

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FIG. 1 hereto is a sample screen of one embodiment of an on screen television display of an EPG which provides for several display areas in which advertising messages appear.

5   International Application No. PCT/US95/11173 (International Publication No. WO 96/07270), the disclosure of which is incorporated by reference herein for all purposes, illustrates an EPG that provides viewer-to-EPG interaction improvements and Picture-In-Guide ("PIG") display of the television program simultaneous with the display of the EPG. Reference is made to U.S. Provisional Patent Application No. 60/055,761, ("ELECTRONIC PROGRAM GUIDE

10   FEATURES"), filed on August 14 1997, the disclosure of which is incorporated herein by reference as if fully stated here.   Reference is made to U.S. Provisional Patent Application No. 60/053,330 ("EPG WITH ADVERTISING MESSAGES") filed July 21, 1997, the disclosure of which is incorporated herein by reference as if fully stated here.

15   **SUMMARY OF THE INVENTION**

The present invention provides systems and methods for communicating viewer profile data to a centralized data center at which analysis of sample viewer profiles can be performed and feedback for advertisers developed. The present invention provides for such communication without the use of a modem in each target household.

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DESCRIPTION OF THE DRAWINGS

These and other features, aspects, and advantages of the present invention will become better understood with regard to the following description, appended claims, and accompanying drawings where:

25   FIG. 1 is a sample of one embodiment of an on screen television display of an EPG which provides for several display areas in which advertising messages appear.

DETAILED DESCRIPTION OF THE INVENTION

A microprocessor in a television set is programmed to monitor each viewer interaction

30   with the television through the viewer's input device, such as the viewer's remote control device. The microprocessor in the television set is further programmed to translate and convert the data representing the viewer's interaction profile data (the "viewer profile")into a coding scheme. A traditional telephone handset is used to transmit the audio representation of the encoded data. A computer at a central location is programmed to decode the encoded data.

35   In one embodiment of the invention, the collected data is coded and is stored in RAM, located at each television viewer's television set. The data can be stored over a specific time interval. for instance, a one month period, after which the data is refreshed for the next month.

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In this embodiment, 0701970801971436 might stand for the time period from July 1 to August 1, 1997, during which time the user accessed the EPG 1436 times.

5   Upon pressing a unique combination of remote control keys, the stored data is displayed as a string of numbers on an information screen on the television monitor. As an alternative to pressing the unique combination of remote control keys, the user can be prompted to select the appropriate information screen from the EPG menu.

          In this embodiment, a staff representative of an EPG information provider, e.g., a staff
10   representative for the Guide Plus customer service center, could call television viewers/EPG users (hereinafter, EPG user) to ask the EPG users to read aloud the encoded information. A computer at the EPG information provider office could generate requests for EPG users to be called. The request could automatically dial the telephone number of each selected EPG user. Phone numbers for EPG users could, for example, be collected from warranty card information
15   for television sets in which the software was installed.

          In this embodiment, the staff representative would ask the EPG user to access the encoded information by, for instance, pressing a unique key combination on the viewer's remote control device, or by selecting a particular information screen option from the EPG's menu. The EPG user would then be asked to read aloud the numbers displayed on the information screen.

20   The encoded viewer profile information read aloud by the EPG user must be provided to the centralized EPG information service provider's computer. One way to do so is for the audio signal from the telephone to be connected directly to a computer with speech recognition capabilities. Another way to provide the information to the centralized computer is for the EPG information provider staff representative to enter the encoded information online to the computer
25   as the numeric strings are read aloud by the EPG user.

          Once the EPG user finishes reading the numbers from the screen, the EPG staff representative would signal the computer that the data collection for the particular user has been completed. At that point, the computer could generate the next request and dial the telephone number for the next EPG user.

30   In another embodiment of the invention, the viewer profile data is collected and is converted into digital representations of audio tones. Then, when the special key combination is pressed, or when the user selects the special information screen, the data is output as audio tones from the television speaker.

          In this embodiment, the EPG information provider staff representative would call EPG
35   users, as is described above, and request that the EPG user place the telephone handset near the speaker of the television before pressing the appropriate remote control device key combination, or selecting the appropriate information screen. In this embodiment, there is, at the EPG service provider's location, a telephone connection directly to the centralized EPG service provider's

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computer. When the EPG user enters the information screen, the encoded tones are emitted by
the television speaker, transmitted by the telephone connection to the central EPG information
5   service provider's computer, and are recorded by the centralized computer. The tones are
subsequently decoded (using, for instance, DTMF decoding).

In still another embodiment of this invention, a dictionary of 256 words is created, each
word representing a unique combination of 8 bits. The objective in selecting the words is that
the words should be distinctive and easily identifiable. The approach of using only a select list
10   of words recognized by a "dictionary" of terms improves recognition by the EPG representative
and/or by speech recognition equipment at the central computer. The limited term dictionary
approach reduces transcription and/or recognition errors.

In this embodiment, each word could represent a particular ASCII character, which in turn
represents certain information about the television viewer/EPG user. Each such word could
15   represent a single, discrete piece of information about the viewer. Alternatively, each word
could represent one of 256 possible combinations of YES/NO flags for eight (8) different
categories of information about the television viewer/EPG user.

In this embodiment, the viewer profile data is collected and is converted, using a
translation table, into one or more of the terms of the dictionary. When an EPG user is called,
20   as is described above, the EPG user is asked to press the appropriate key combination, or select
the appropriate information screen, and read aloud into the telephone handset the words listed
on the information screen. As is described above, there is, at the EPG service provider's office,
a direct connection to the centralized computer. As the EPG user reads the words aloud, they
are recorded by the computer. Alternatively, the EPG staff representative can enter the words
25   online by keying them, or can complete an online "questionnaire." The words read by the EPG
user can then be translated by the centralized computer into the appropriate binary data for
advertising auditing purposes. Because the words represent binary data, industry standard error
checking and correction techniques can be used.

This embodiment can be used in combination with the above-described embodiment in
30   which the television speaker emits sounds. That is, instead of asking the user to read the words,
the user is asked to place the telephone handset next to the television speaker so that when the
user enters the appropriate key combination or selects a particular information screen from the
EPG menu, the television speaker will emit audible sounds that represent the dictionary terms
that represent the viewer profile information.

35   The embodiments of the invention described herein are only considered to be preferred
and/or illustrative of the inventive concept; the scope of the invention is not to be restricted to
such embodiments. Various and numerous other arrangements may be devised by one skilled
in the art without departing from the spirit and scope of this invention. For example, alternative

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terms for the dictionary of terms can be used. As an other example, the number of words in the dictionary can vary; any number of words could be used.

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WHAT IS CLAIMED IS:

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1.   A method for communicating data concerning a television viewer's interactions with the viewer's television comprising the steps:

encoding the data collected concerning a television viewer's interactions with the viewer's television;

10   prompting said television viewer to communicate via telephone with a central data collection service which includes a computer;

prompting said television viewer to access said encoded data;

displaying said encoded data on the display monitor of said television viewer's television;

prompting said television viewer to read aloud into said television viewer's telephone

15   handset the encoded data displayed on said television viewer's television display monitor;

communicating said encoded data into said computer, said computer recognizing said encoded data read by said viewer;

converting said encoded data into said computer into binary data representing said viewer's profile data.

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2.   The method of claim 1, wherein said encoded data comprises terms selected from a pre-established dictionary of terms.

3.   The method of claim 1, wherein said encoded data comprises alphanumeric strings.

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4.   A method for communicating data concerning a television viewer's interactions with the viewer's television comprising the steps:

translating the data collected concerning a television viewer's interactions with the viewer's television to digital audio data;

30   prompting said television viewer to communicate via telephone with a central data collection service which includes a computer;

prompting said television viewer to place the viewer's telephone handset in close physical proximity to the speaker of said television;

prompting said television viewer to access the store of digital audio data;

35   emitting said digitized audio sounds by said television's speaker;

entering said audio sounds into said computer, said computer recognizing said audio sounds;

converting said audio sounds into binary data representing said viewer's profile data.

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        5.   A microprocessor programmed to operate with a display monitor having a screen
and a RAM local to said microprocessor so as to generate signals that display information stored
5   in the RAM on the display monitor;
        said microprocessor additionally programmed to store in said RAM every viewer
instruction sent to the television by the viewer's remote control device and store in said RAM
data related to the status of the television, the television tuner and the content of the signal tuned
immediately prior to said instruction to the television and immediately following said instruction
10   to the television, including but not limited to the: Date of said instruction, time of said
instruction, channel tuned by said television immediately prior to said instruction, channel tuned
immediately following said instruction, operating mode of said television immediately prior to
said instruction, operating mode of said television immediately following said instruction, the
identity of advertisements that the viewer watched, the identity of advertisements that the viewer
15   was watching immediately before changing channels, the identity of programs that the viewer
watched, and the identity of programs that the viewer was watching immediately before changing
channels.

        6.   The microprocessor of claim 5, additionally programmed to:
20   retrieve television scheduling data, including program titles, advertising data, and other
types of information including but not limited to news data, and sports data;
        display said television scheduling data, said advertising data, and said other types of
information including but not limited to said news data, and said sports data on said display
monitor in viewable form as an on screen electronic television program guide;
25   provide for the selection of one of the displayed program titles from display of said on
screen electronic television program guide for display on said display monitor;
        provide for the selection of one of the displayed program titles for recording;
        provide for the selection of one of the displayed program titles for watching;
        provide for the selection of advertisements displayed on said display monitor as part of
30   said on screen electronic television program guide for display of additional information
concerning said advertisement.

        7.   The microprocessor of claim 6, additionally programmed to:
        store in said RAM every viewer instruction sent to said on screen electronic television
35   program guide by the viewer's remote control device and store in said RAM data concerning the
on screen television program guide and the content of said guide immediately prior to said
instruction to said guide and immediately following said instruction to said guide, including but
not limited to: the identity of every said displayed program title for which the viewer requests

additional information, the identity of every set of said news data for which the viewer requests additional information, the identity of every set of said sports data for which the viewer requests additional information, the identity of every program title that the viewer selects to be recorded, and the identity of every program title that the viewer selects to be watched.

8. The microprocessor of claim 5, additionally programmed to translate said stored viewer instruction data and said related data into words selected from a dictionary of terms stored in said RAM local to said microprocessor;

said microprocessor additionally programmed to display said words on an information screen on said display monitor of said television.

9. The microprocessor of claim 7, additionally programmed to translate said stored viewer instruction data and said related data into words selected from a dictionary of terms stored in said RAM local to said microprocessor;

said microprocessor additionally programmed to display said words on an information screen on said display monitor of said television.

10. The microprocessor of claim 5, additionally programmed to translate said stored viewer instruction data and said related data into binary representations of digitized audio sounds;

said microprocessor additionally programmed to store said binary representations of digitized audio sounds in said RAM local to said microprocessor;

said microprocessor additionally programmed to produce, in response to user instruction, digitized audio sounds, representative of said binary representation of digitized audio sounds.

11. The microprocessor of claim 7, additionally programmed to translate said stored viewer instruction data and said related data into binary representations of digitized audio sounds;

said microprocessor additionally programmed to store said binary representations of digitized audio sounds in said RAM local to said microprocessor;

said microprocessor additionally programmed to produce, in response to user instruction, digitized audio sounds, representative of said binary representation of digitized audio sounds.

12. The microprocessor of claim 5, additionally programmed to translate said stored viewer instruction data and said related data into binary representations of digitized audio sounds;

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said microprocessor additionally programmed to store said binary representations of digitized audio sounds in said RAM local to said microprocessor;

5   said microprocessor additionally programmed to produce, in response to user instruction, digitized audio sounds, representative of said binary representation of digitized audio sounds;

a second microprocessor programmed to recognize said digitized audio sounds;

said second microprocessor programmed to decode said digitized audio sounds to binary representations of said audio sounds;

10   said second microprocessor programmed to convert said binary representation of said audio sounds to binary representations of said viewer instruction data and said related data.

13.   The microprocessor of claim 7, additionally programmed to translate said stored viewer instruction data into binary representations of digitized audio sounds;

15   said microprocessor additionally programmed to store said binary representations of digitized audio sounds in said RAM local to said microprocessor;

said microprocessor additionally programmed to produce, in response to user instruction, digitized audio sounds, representative of said binary representation of digitized audio sounds;

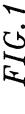a second microprocessor programmed to recognize said digitized audio sounds;

20   said second microprocessor programmed to decode said digitized audio sounds to binary representations of said audio sounds;

said second microprocessor programmed to convert said binary representation of said audio sounds to binary representations of viewer instruction data and said related data.

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10:03PM

PIP WINDOW

DISPLAYING REAL TIME
VIDEO FOR LAST
CHANNEL VIEWED

AD WINDOW 1

DISPLAYING PANEL AD

AD WINDOW 2

DISPLAYING PANEL AD

○ WATCH   ○ RECORD

PRIME TIME LIVE: SAM DONALDSON INTERVIEWS
TWO OF GOSPEL MUSIC'S PIONEERS, AMY GRANT
AND SANDI PATTY.

ABC [13]   9:00PM (1h)   cc

| GRID | SORT | SCHEDULE | MESSAGES |

SAT	9:00PM	9:30PM
LAST CHANNEL	PRIME TIME LIVE	
ABC	PRIME TIME LIVE	
FOX	AMER. MOST WANTED	
CBS	EARLY EDITION	
MTV	SPICE GIRLS CONCERT TONIGHT	
UPN	WALKING TALL	
PBS	ON GOLDEN POND	
AMC	REMEMBER	YOUNG PHILA
ESPN	COLLEGE FOOTBALL	

FIG.1

INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : HO4N 7/10
US CL : 345/327, 348/2

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 345/327, 348/2, 1, 906, 554, 7-13.

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5,519,433 A (LAPPINGTON ET AL) 21 MAY 1996, FIGURES 1-19	1-13
A	US 5,758,257 A (HERS ET AL.) 26 MAY 1998, FIGURES 1-11.	1-13

☐ Further documents are listed in the continuation of Box C.   ☐ See patent family annex.

* Special categories of cited documents	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	
"E" earlier document published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
26 OCTOBER 1998	**19 NOV 1998**

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